

SDII
A584
#102

Forest Research Notes

Northeastern Forest

FOREST SERVICE, U.S. DEPT. OF AGRICULTURE, 102 MOTORS AVENUE, UPPER DARBY, PA.

Experiment Station

No. 102
1960

VIRGINIA PINE SEED VIABLE TWO MONTHS BEFORE NATURAL CONE OPENING

Virginia pine (*Pinus virginiana* Mill.) seed used in nurseries and for forest seeding ordinarily is collected from standing or felled trees in autumn. Some questions that concern the seed collector are: How early in the season does Virginia pine seed ripen? How does seed viability change if the cones are left on the felled trees?

To help answer these questions, studies were made at the U. S. Forest Service's Laurel Research Center in central Maryland, where investigations are being conducted in Virginia pine management and silviculture.

Methods

In 1953 a preliminary study was made. Some 300 cones were collected from about 30 trees freshly felled during each of the following four periods: September 1-15; September 16-30; October 1-15; and October 16-31. The cones were dried until they opened. Two hundred seeds from each collection were then placed immediately to germinate in a well-watered mixture of sand and vermiculite. After 15 weeks the percentage of germination was recorded.

In 1954 a more detailed study was begun. For this study 5 trees were felled each week during the 13-week period from August 2 until October 25. Cones were collected from the trees on the day they were felled; in addition, collections were made from the same trees 1, 2, 3, and 4 weeks after felling. Thus, cones from each group of 5 trees were collected on 5 dates. During each collection 10 cones were taken from each of the 5 trees and the 50 cones were immediately dried in circulating air at 75° F. After drying for 2 days, they were placed in a large oven where air was circulated at a uniform temperature of 120° F. When most of the

50 cones had opened, the seeds were extracted and cleaned. Viability was tested at once by placing a 100-seed sample in a well-watered mixture of sand and vermiculite at room temperature.

Results and Discussion

The pattern of seasonal seed viability uncovered by these studies was unexpected. It was found that Virginia pine cones could be collected as much as 9 weeks before normal opening in late October with assurance of moderate to good seed viability. This was noted in both 1953 and 1954. In both years the seed first became viable during August and reached high viability by the beginning of September.

In 1953, this early September high was followed by a slight drop, and then in October a rise to maximum viability for the year:

<u>Collection period</u>	<u>Germination (percent)</u>
September 1-15	45
September 16-30	34
October 1-15	54
October 16-30	76



Figure 1.--Collecting Virginia pine cones from a felled tree after an early September logging.

Table 1.--Viability of Virginia pine seed,
by date of collection, 1954

Trees felled (date)	Germination	Trees felled (date)	Germination
<u>Percent</u>		<u>Percent</u>	
August 2	0	September 20	43
August 9	1	September 27	43
August 16	0	October 4	52
August 23	25	October 11	36
August 30	62	October 18	39
September 7	86	October 25	37
September 13	51		

In the more detailed study of seed ripening in 1954, maximum viability for the year--86 percent--was reached in early September; from then until natural seedfall in late October, germination tended to decline (table 1). This decline in germination is difficult to interpret. It has no known precedent in pine (1, 2, 3, 4), and is contradicted by the 1953 experiment. It is hoped that this aspect can be examined further, and conclusions can be made as to whether the decline in germination late in the fall of 1954 was due to faulty technique or was real. Whichever the case, in both 1953 and 1954 the seed did become viable enough in early September to justify collecting.

In a second facet of the 1954 study, it was found that seed collected from trees that had been felled for 1 to 4 weeks was as viable as seed collected the day of felling. In fact, in certain cases, seed increased in viability by being left on the felled trees. This occurred on trees felled during the first two weeks in August. Apparently some natural seed ripening continued.

Literature Cited

- (1) Fowells, Harry A.
 1949. An index of ripeness for sugar pine seed.
 U. S. Forest Serv. Calif. Forest and Range
 Expt. Sta. Forest Res. Note 64. 5 pp.
- (2) McLemore, B. F.
 1959. Cone maturity affects germination of longleaf
 pine seed. Jour. Forestry 57: 648-650.

- (3) Maki, T. E.
1940. Significance and applicability of seed maturity indices for ponderosa pine. Jour. Forestry 38: 55-60.
- (4) Wakeley, Philip C.
1954. Planting the southern pines.
U. S. Dept. Agr., Agr. Monog. 18. 233 pp.

--THOMAS W. CHURCH JR.
and EDWARD I. SUCOFF

Mr. Church, who formerly served as a research forester with the Northeastern Forest Experiment Station, is now at the Marquette Research Center of the Lake States Forest Experiment Station, Marquette, Michigan. Mr. Sucoff, a research forester, is with the Northeastern Station's Laurel Research Center, Laurel, Maryland.